StratiCad

Software processing geotechnical borehole data within your CAD platform

(compatible with AutoCAD®, AutoCAD LT®, Bricscad™, and ZWCad™)

Version 1.4

User Manual

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A Introduction

StratiCad is dedicated to semi-automatic drawing of geotechnical data within your CAD software.

It combines efficiency, simplicity, and graphical quality, providing significant time savings, even when dealing with a small number of boreholes.

The StratiCad application is made of two modules, which can be purchased separately:

- The 'Layout' module, used to represent boreholes in top view or longitudinal profile, and export their position and properties.
- The 'Log' module builds graphical representations of boreholes in the form of blocks.

StratiCad uses the physical key based Aladdin protection system.
There are three types of licenses:

- **Single computer** license: the USB protection key must be connected to the computer using the software.
- **Network** license: the USB protection key must be connected to the computer where the license server is installed, and the computer using the software should be connected to the license server through the network.
- **Evaluation** license: the USB protection key includes a report and export quota (limited use). Once the quota reached, the software is deactivated.

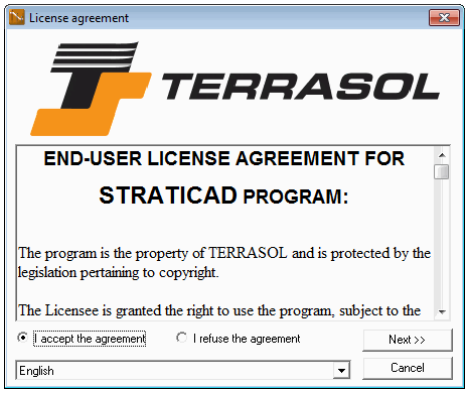
Caution: when launched, StratiCad fully examines the type of license you use. This step can **take several seconds** and hold your CAD system from launching for a while.

B Installing StratiCad and integration with CAD platforms

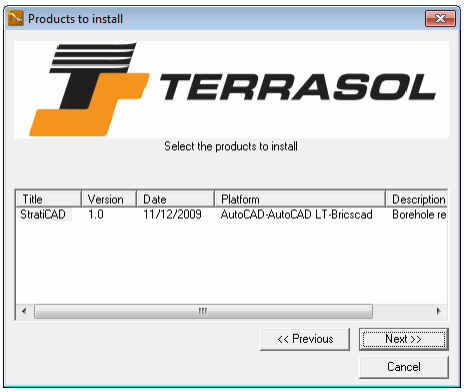
B.1 Installing StratiCad

Preamble: check you have the latest version of the Straticad installer (for example on our Internet site www.terrasol.com) and a compatible CAD platform (AutoCAD® 2000-2013, AutoCAD LT® 2000-2013, Bricscad™, ZWCad™, etc.).

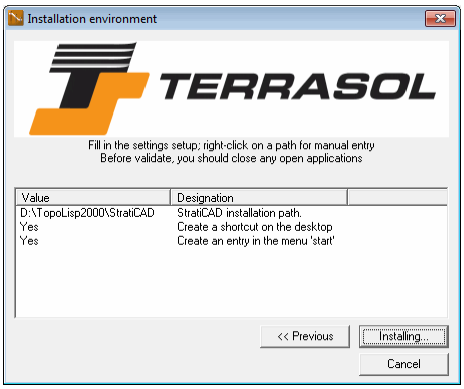
To install StratiCad, launch its installer (StratiCad-x.x.exe) in the Administrator Mode. The following window shows up.



Read the license agreement, and if you accept it, select 'I accept the license agreement', and click the **Next >** button.

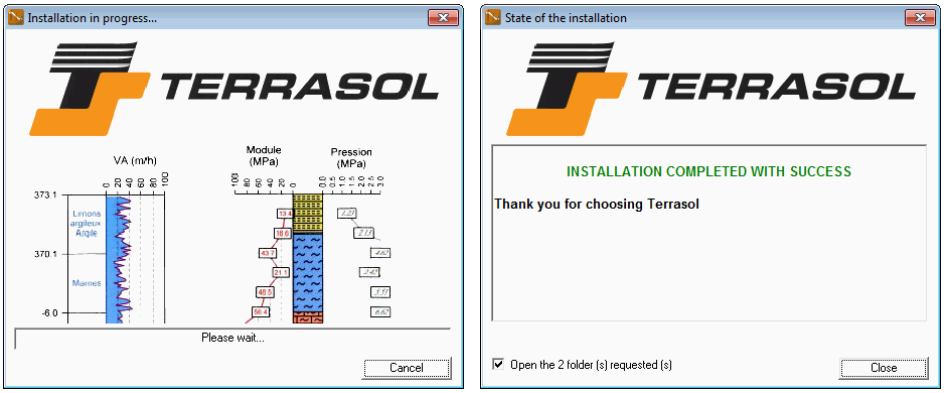


Click the **Next >** button.



This window allows selecting the destination directory for the application's installation, as well as creating shortcuts on the desktop or not and/or in the **Start** menu of Windows®. To ensure subsequent technical support, avoid changing the destination directory.

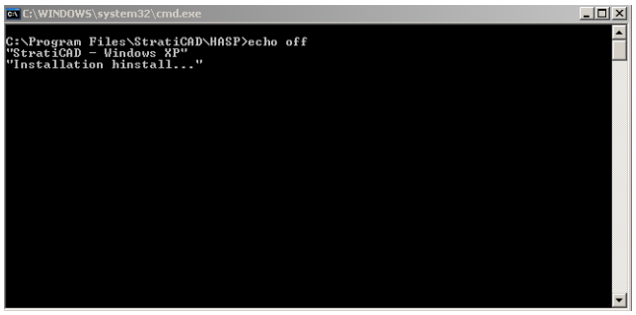
Click the **Install** button.



Once the installation finished, a message indicates whether it was performed properly. If not, the installer indicates the errors encountered. In the latter case, improperly closed files may be blocking the installation: restart your computer, and resume the install procedure.

After installing StratiCad, click **Close**, and the key driver is installed automatically (if the **Open the 2 files requested** box is properly checked).

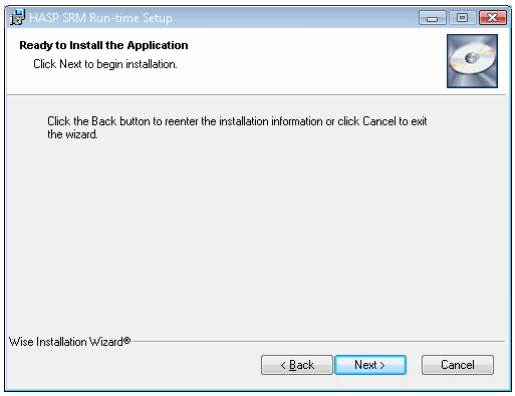
- If your operating system is Windows XP®, the following window shows up.



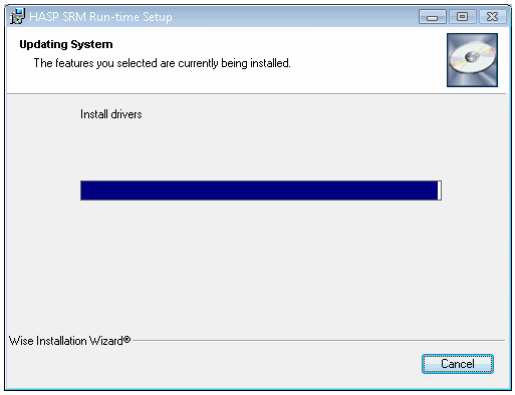
Once the installation is complete, a message indicates 'the operation was completed successfully'. Click **OK**.

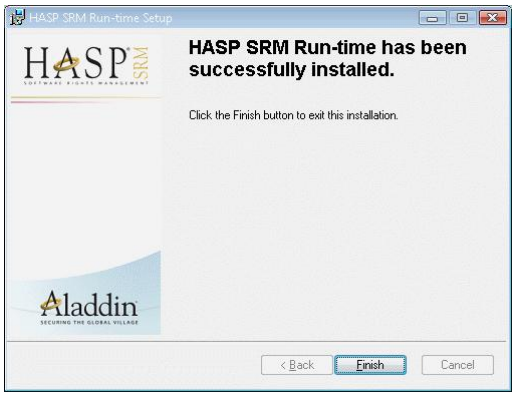
- If your operating system is Vista® or Windows 7®, the following window shows up.

Click the **Next >** button.

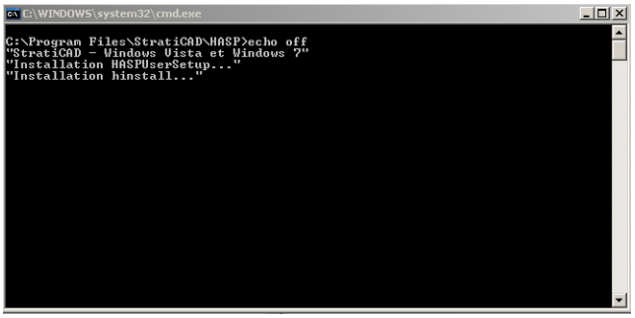


Click the **Next >** button.





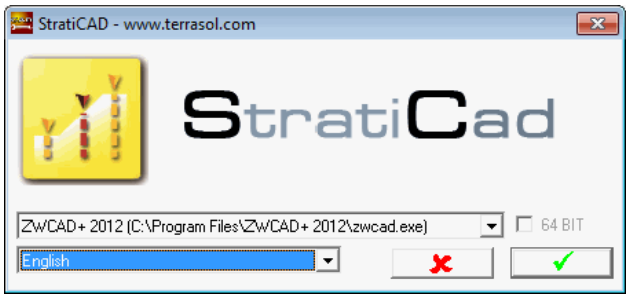
Click the **Finish** button. The following window shows up.



Once the installation is complete, a message indicates 'the operation was completed successfully'. Click **OK**.

By default, the installation creates a desktop shortcut for StratiCad and another shortcut in the **Start/programmes** menu. The **Start/programmes** menu also includes the documentation and configurator.

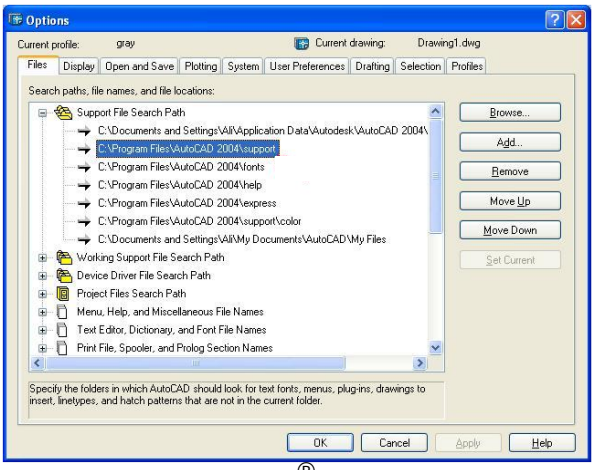
The configurator is launched upon the first connection. Select the CAD platform used in the **Connection** drop-down list. Validate by clicking **OK**.



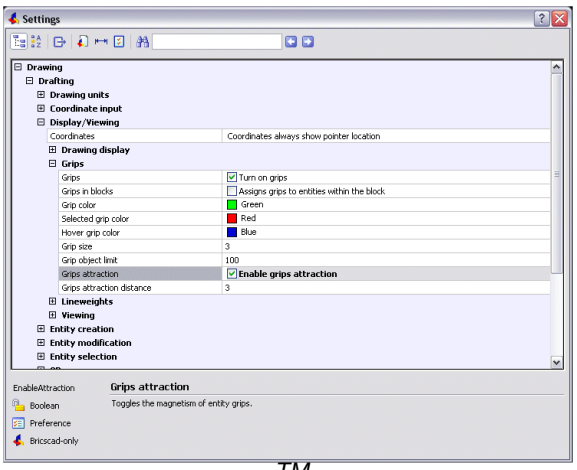
It's possible to change the type of connection later using **Start Menu / All programmes / StratiCad**.

B.2 Integrating StratiCad to the Autocad® and Bricscad™ environments

On computers running 'full' AutoCAD® (not LT version), click the **Options…/Tools** menu. On the **Files** tab, define for the **Support File Search Path** the **CADFile** subdirectory in the Straticad installation directory (by default: C:\Program Files\StratiCad\).



Autocad® environment



Bricscad™ environment

StratiCad works in drawings including the required block definitions as well as the required text and line styles. Dynamic blocks are accepted except with AutoCAD LT®.
Beware: StratiCad does not manage annotation text styles, but accepts annotation blocks.

The borehole data may be imported from data sources in different formats. Examples of data files are available in the **Samples** file of the installation directory.

Some functions use a temporary work zone in the drawing: upon first use, you have to define it with its centre and radius. Then, you can edit or view it with the **StratiCad/Defining the work zone** and **StratiCad/Zoom on the work zone** menu items. It is important that this zone remains empty.

Some extensions correspond to backup files used by StratiCad to save and reload the settings of the links between the drawing objects and the data sources:

- **.asso*: block association file, with scale and layer,
- **.attr*: association file for the link attribute/data source column,
- **.hach*: hatching association file, with scale, colour and layer.

B.3 Integrating StratiCad to the Autocad LT® environment

B.3.1 Configuration and recommendations

On computers running AutoCAD LT®, StratiCad is present in the form of an icon placed in the Windows® task bar (lower right corner of the screen).

The installation is automatic and upon the first launch StratiCad is ready to operate. Nevertheless, from version 2009, we recommend working in the **classical AutoCAD LT®** workspace (Tools menu), or displaying the menu bar with the **menubar** system variable (value 1).

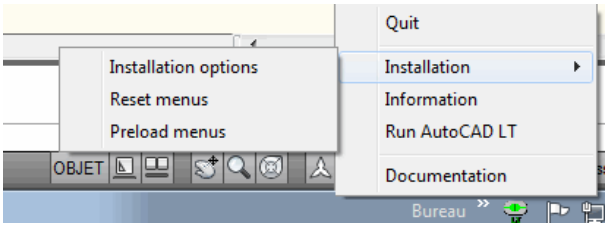
In case of abnormal operation, contact our hotline. Some system parameters may need to be changed depending on the computer settings.

When running, StratiCad uses a temporary work directory. By default, it is **C:/tmp**. It may be customised. In addition, the data linked to the drawing are saved in a file named after the drawing, but with the .DWI extension.

The colour of the StratiCad icon indicates the application status:

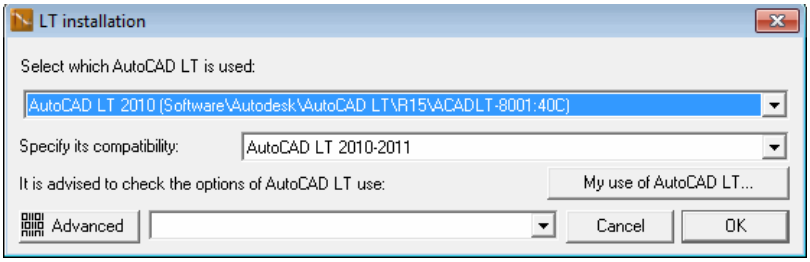
- Red: AutoCAD LT® is not detected. Double clicking the icon launches AutoCAD LT®.
- Yellow: AutoCAD LT® is run, but the StratiCad menu is not loaded. Double-clicking the icon executes the installation wizard.
- Green: StratiCad is ready to run
- Dark green and yellow: StratiCad waits for an object to be defined in AutoCAD LT®.
- Grey with the ‘ zzz ’ text: StratiCad is in standby mode and you are presently working with another software.

A right-click on the icon opens the following menu.



This menu allows to:

- Access the documentation.
- Get information on the software version and company data.
- Change the installation settings, update the menus, preload the menus into AutoCAD LT® if you do not wish to work with automatic installation. The other options are for hotline use only.

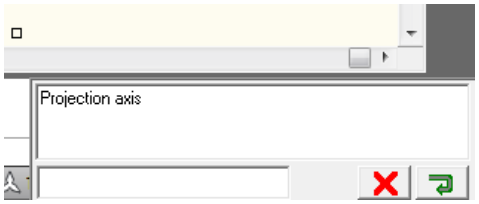


- Quit StratiCad.

The following comments are applicable with AutoCAD LT®:

- The StratiCad bar is positioned above the AutoCAD LT® title bar. This bar allows to view the current DWG file path, and includes the icons of the last five activated commands. This bar is active:
  - If you click the DWG file path, a file explorer opens with the current DWG file directory,
  - If you click a command icon, the command is restarted,
  - If you click the StratiCad icon on the left, the display of the bar is modified.
- The names of the layers, or text and line types should not contain any **Blank** or **Space** character. Use names like 'NewBoreholes' or 'New-Boreholes'.

- When a StratiCad command requests to select an object or point, a window appears in the low and right part of the screen. It includes a comment on the action to perform as well as two buttons: a red 'X' allowing to cancel the selection (equivalent to the *escape* key), and a green arrow corresponding to the enter key or right-click.



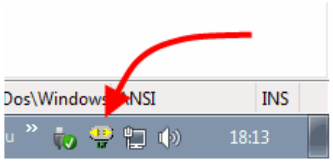
- AutoCAD LT® can handle one single StratiCad application at the same time. Otherwise, actions launched in one AutoCAD LT® may be run in the second. If you need to open several drawings, please open them in the same current AutoCAD LT® session.
- Some wrong operations may block the application. Use the **StratiCad/LT Tools/Release the DWG AutoCAD LT** menu to check for any error.

Finally, check that your drawing template is complete: it should include the layers, blocks, text and line styles to be used. Then click the commands **Declare the drawing styles and layers** and **Declare attributes blocks** in the **StratiCad/LT Tools** menu so that StratiCad is able to use it.

B.3.2 Menu troubleshooting

The detection of menus is a compulsory step for Straticad to operate properly in AutoCAD LT® environment. Straticad usually loads the menus and places some options automatically. If a problem occurs and prevents menus detection, no command will work and the Straticad icon will be yellow.

If the Straticad icon (besides the time display) is yellow: check if the menu is displayed. If necessary, right-click on the yellow icon; in the popup menu, select « Installation/Reset menus ». Then quit Straticad and start it again.



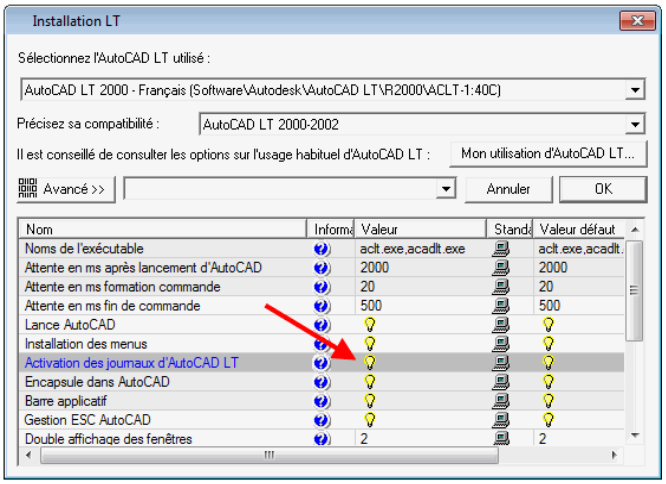
If the Straticad icon is yellow, it means that menus cannot be found.

Problem of missing menus

- Check that the AutoCAD LT menu bar is displayed. Indeed, from version 2009, it can be hidden. To make it visible, type the following command line in AutoCAD LT: "menubar", and provide a value of 1.
- Right-click on the Straticad icon and select « Installation/Preload menus ». Before that, if you are using version 2006 or higher, deactivate dynamic input using command line DYNPROMPT and providing a value of 0.
- If menus are still missing, please contact our hotline.

Problem of yellow icon (with menus being loaded)

- Try to load another drawing file. Sometimes it solves the problem.
- Try manual detection using AutoCAD LT menu « StratiCAD/AutoCAD LT/----/ AutoCAD LT Synchronisation ». If it does not work, right-click on the Straticad icon, select menu « Installation/Installation options » and check that logs are active. If they are not, activate them and Start Straticad again (by right-clicking in the icon). Try manual detection again.
- If menus are still missing, please contact our hotline.



Logs activation

B.4 Installing a 'network' protection key

The license server installation is a complement to the installation of StratiCad and of the HASP device driver. It is required if you ordered a network key and will use the software in the 'Network' mode (a single network key for n users). The network key must be connected to the USB port of the computer where the HASP license server is installed. The 'server' computer should be connected to the network with a standard Windows® protocol (NetBui or TCP/IP type).

Full installation of the software on the 'server' computer is not necessary if Straticad is not to be used on the 'server' computer.

The installation of the network key requires:

- Installation of the key device driver and 'license server' on the computer to which the network key will be connected. This may be any computer in the network, but it must be 'visible' to all client computers, and it must be powered on and connected to the network permanently.
- Typical installation on client computers: installation of StratiCad and the usual key driver on each client computer.

When running StratiCad on client computers, it automatically detects the 'network key' if it is present on a computer on the network.

For the 'server' computer, the detailed installation procedure is the following:

- Install the license server provided on the installation DVD-ROM or on our web site www.terrasol.com (software / FAQ / Network section), and follow the instructions on the screen.
- Install the most updated version of the HASP key driver on the 'server' computer (driver provided on the installation DVD-ROM or on our web site www.terrasol.com (software / FAQ / Network section)).

Finally, install StratiCad (including the key driver) on all 'client' computers (follow for each computer the procedure described in chapter B.1.), then test StratiCad on a client computer.

B.5 Uninstalling StratiCad

Currently, there is no automatic un-installation feature for StratiCad.
To uninstall it, go to C:\Program Files and remove the StratiCad directory, then manually remove the icon, as well as the shortcut in the **Start/Programmes** menu.

C User Manual

C.1 Settings Menu

C.1.1 StratiCad configuration

Menu: StratiCad/Configuration/StratiCad configuration
If you exchange files with AutoCAD LT®, activate this option and transfer the DWI file together with the DWG file.
This command is not documented. If necessary, please contact the hotline.

C.1.2 Activating AutoCAD LT® compatibility

Menu: StratiCad/Configuration/Activate AutoCAD LT® compatibility
If you exchange files with AutoCAD LT®, activate this option and transfer the DWI file together with the DWG file.
This command is not documented. If necessary, please contact the hotline.

C.1.3 Default units (INSUNITSDEF...) in block insertion

Menu: StratiCad/Configuration/Deactivate default units
Deactivates the default units (INSUNITSDEF...) in block insertion.
In AUTOCAD®version 2006, Autodesk® activated the drawing units in order to adjust the block scale automatically. Unfortunately, the drawing units existed well before AUTOCAD® 2006 version, and were hardly used. This generates wrong insertions where blocks are subject to a variable scale factor.
To resolve this, carefully select the units of all your drawings, or use this command: it sets the default units to 'undefined' (INSUNITSDEFSOURCE and INSUNITSDEFTARGET AutoCAD® variables), without changing the drawing unit.
This command is valid only from AUTOCAD® version 2006.

C.1.4 Drawing units (INSUNITS)

Menu: StratiCad/Configuration/Deactivate drawing units
This command is not documented. If necessary, please contact the hotline.

C.2 Work zone

C.2.1 Defining the work zone

Menu: StratiCad/Defining the work zone
The work zone, defined by its centre and radius, should be empty and is used by StratiCad.
StratiCad needs a work zone in order to prepare its constructions. This zone should remain empty. Otherwise, you will be prompted to clean it.
The work zone is circular: you define it by its centre and radius. It is then stored in the drawing. The zone must be large enough to include any column to be created.

C.2.2 Zoom on the work zone

Menu: StratiCad/Zoom on the work zone
The work zone, defined by its centre and radius, must be empty and is used by StratiCad.

If the work zone has been defined, the drawing will be positioned on it, to allow you, for example, to clean it.

C.3 Data sources

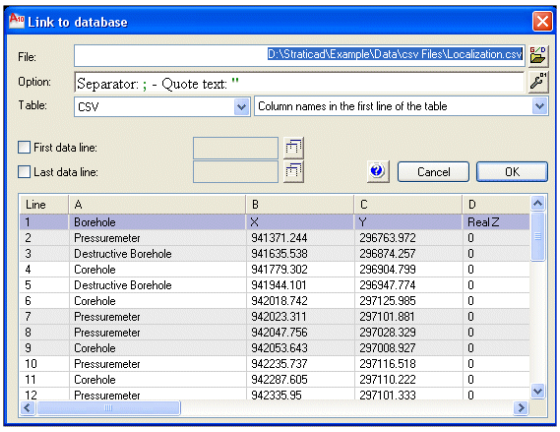
C.3.1 Defining a data source

A data source is defined by its file. The  button allows to select the data file using our explorer. The compatible file formats are:

- CSV text files (each element is separated by a semi-colon or another character)
- Microsoft Excel® (from version 2003)
- OpenOffice spreadsheet files
- Microsoft Access® databases (from version 2003).

We recommend to close the data source file before connecting to it.

If the file is in the CSV format, use the  button to specify the character used as a column separator, as well as the one used to begin and end a character string. If you have doubts on these elements, right-click the  button in order to view the CSV file in text format, and hence be able to check its structure.



Line	A	B	C	D
1	Borehole	X	Y	Real Z
2	Pressuremeter	941371.244	296763.972	0
3	Destructive Borehole	941635.538	296874.257	0
4	Corehole	941779.302	296904.799	0
5	Destructive Borehole	941944.101	296947.774	0
6	Corehole	942018.742	297125.985	0
7	Pressuremeter	942023.311	297101.881	0
8	Pressuremeter	942047.756	297028.329	0
9	Corehole	942053.643	297008.927	0
10	Pressuremeter	942235.737	297116.518	0
11	Corehole	942287.605	297110.222	0
12	Pressuremeter	942335.95	297101.333	0

If the data source includes several data tables, select the one containing the relevant information in the **Table** drop-down list. In the case of a CSV file, there is only one table; in a spreadsheet file, tables correspond to the page tabs; finally, for a database, the tables are those of the database.

Depending on the data source and your work habits, the data do not always start on the first line. Use the **First data line** and **Last data line** boxes to define or outline a work range. However, for commands exporting values to data sources, we recommend not to set a last line for the work range. Indeed, part of the objects selected in Autocad® may be outside the chosen work range, in which case this 'beyond selection' information will be written after the last line in the work range, and hence may clear or overwrite existing data.

The names of the columns may be other than 'A', 'B',... They should be filled in a line of the table, and you may specify in the drop-down list (on the right) whether the names are defined on the first line of the table or on the line preceding the data.
The lower part of the window displays the content of the data source. If the line with the column names has been defined, it appears with a purple background. If a work range has been configured, it is displayed with a light green background.

C.3.2 StratiCad principle for reading data sources

The links between StratiCad and data sources are saved with the drawing, directly in the *.dwg* file for Autocad® and in a *.dwi* file for Autocad LT®. This *.dwi* file is saved in the same directory as the file with which it was created.
When reopening a drawing with StratiCad, if this drawing has one or several links with one or several data sources, the configuration of these links, as well as the graphic options used for boreholes layout and columns drawing, are restored. If, between two issues of a drawing, boreholes have been completed or added to the data source, running StratiCad commands again updates your drawing and your boreholes library (no need to redefine the links or graphic options. These are restored automatically when loading the drawing).
StratiCad tools read data sources on the principle of loops. The event determining the start and end of a loop is the change of text in the column storing the borehole names.

Name	Depth	EM	PI
SC1	1	2.5	0.2
	2	4	0.5
	3	15	0.89
	4	12.5	1.25
	5		
SC2	1	2.3	0.2
	2	3	0.5
	3	3.5	0.89
	4	8	1.25
	5		
BH108	2.5	10	3.02
	3	100	2.79
	6	80	4.25
	7.5	60	4.35
	13.5	0	4.35
	15	50	4.35
	16.5	30	4.34
	20	0	4.36
	21		
SPR011	2	51.5	4.35
	3	236.3	4.36
	4	288	4.35

The process completely stops when this column storing the borehole names, as well as the other columns chosen by the operator when initialising the Database / AUTOCAD® link, are all empty.
Inside these loops, the data source lines are read one after the other, line after line.
For instance, if we have on a same line:

Name	*Depth*	*Text*	*Module*
SC 100	*3.35*	*Brown clay*	*50.82*

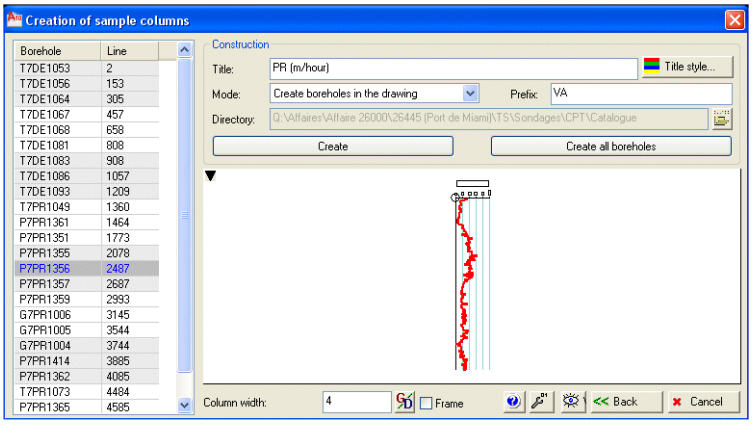
This means that for the borehole named SC 100, at 3.35 m depth, we should have the text 'brown clay', as well as a Module value of 50.82.

C.3.3 Comment about the 'Log' module

Creating logs (columns) starts with one of the dedicated commands: column curve, column levels, etc. These commands define log templates to be used for a data source containing boreholes. The application of a log template (column "style") to one or several boreholes allows creating blocks called '*log blocks*' or 'column blocks'. These log blocks are true AutoCAD® blocks.

The construction of each log block is based on a log template and a borehole, which is why the block name in AutoCAD® is composed of the user-defined template name, called prefix (e.g. 'boringspeed'), a specific separator, and the borehole name defined in the data source. The separator (by default '_') should be used neither in the prefix nor in borehole names. Moreover, special characters should be avoided, whether in the separator, in the prefix or in the borehole names, in order to comply with AutoCAD® requirements.

Using a prefix allows Straticad to identify the log template, which is used in the meta-block and log insertion commands for example, in order to distinguish two separate variables for which the text log tool has been used.
Beware: creating columns creates blocks, but no display. Display is possible by manual insertion of column blocks, or by automatic insertion using the log insertion command.



Once the column template configured, the window above opens, and allows creating column blocks. Use the **Prefix** input to provide an identifier for the column template, and specify the block creation mode (in the drawing or in a directory as DWG or DXF file for Autocad LT®).

It is possible to change the column width, to rename the column, or to frame it by a polyline.
The left part of the window displays the list of boreholes read in the data source. The selected borehole, or the first borehole in the selection, is displayed in the preview window. For log tools offering the hatching option, complex hatching patterns may be displayed partially in order to limit the processing time: a *beep* is then emitted. The log block insertion point is represented by a small circle, which is not customizable.

You may create the log blocks for all boreholes, or only for the blocks selected in the left part. The block creation uses an empty zone in the drawing called work zone, which should be defined upon first use (refer to chapter C.2).

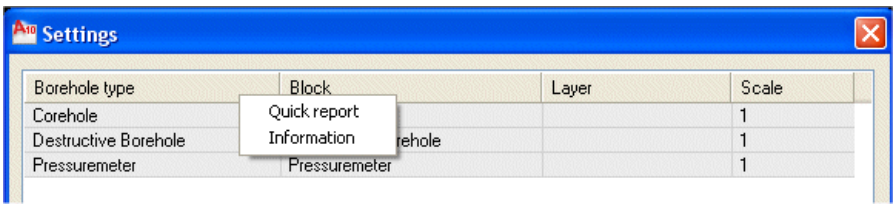
The  button generates a preview of the borehole selected in the drawing. To do this, click on the insertion point to display the borehole, then click any other point to close the preview. This preview will not be cleared automatically because it is not a block.

Various parameters (prefix/name separator, line scale, ...) may be customized using the  button.

C.4 Interface elements

C.4.1 Lists

For both "Layout" and "Log" modules, lists are used for easy presentation of a data set with identical structure. Right-clicking a column name opens a pop-up menu and enables either to print a report on the list content or to display column legends.



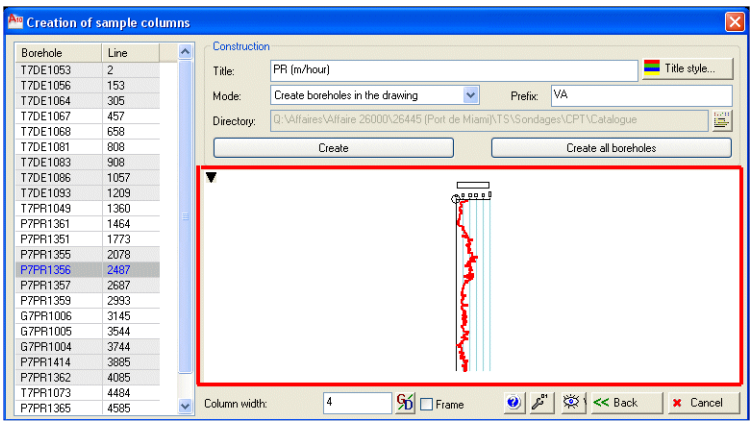
Small edition icons are available on the selected line in the table, among which:

- input of a point or object in the drawing
- selection within a preset list
- text input through a dedicated window
- selection of a column or line in the active data source

If several lines are selected, edition is performed for all these lines.

C.4.2 Views

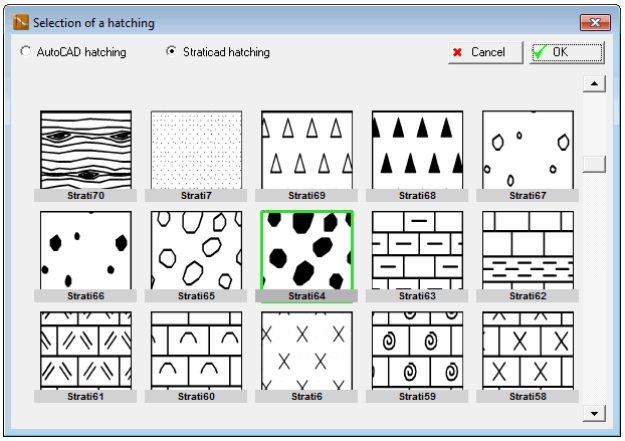
Some results may be previewed using a graphic view (for both modules "Layout" and "Log"). This view allows the use of the mouse wheel as in AutoCAD®: a forward-back movement to zoom in and out, pressing while moving the mouse to get a panoramic view, and double-clicking for extended zoom. If the zoom is not working, first left-click inside the window to select it.



Preview window outlined in red

C.4.3 Hatching pattern selection (Log module)

There are two hatching pattern galleries: standard AutoCAD® hatching patterns (including solid hatching), and specific StratiCad hatching patterns (designed especially to represent soil layers). Additional hatching patterns may be added manually: create a picture file of the hatching pattern in BMP format, and make sure you have the PAT definition file for the pattern. Copy these two files into the CacheUsr/HachureStd or CacherUsr/HachureSpe sub-directories of the StratiCad installation directory. The BMP file should be rather small: about 50x50 pixels.



C.5 Help

C.5.1 Online help

 - *Menu: StratiCad/Help/Online help*
StratiCad manual with active links and screenshots.

C.5.2 Manual

Menu: StratiCad/Help/PDF user manual
Straticad manual in pdf format.

C.5.3 FAQ

Menu: StratiCad/Help/Frequently Asked Questions (FAQ)
List of hints about AutoCAD® use in combination with StratiCad.

C.5.4 Example files

Menu: StratiCad/Help/Example files
The StratiCad installation folder includes a sub-directory named '*Samples*' containing:

- An Autocad® drawing in versions 2000 to 2010
  This drawing contains a top view project axis as well as the longitudinal profile of this project. Some blocks and text styles are available.
- A directory named 'Data Sources'
  Data sources in various formats: Microsoft Excel® 2003 and 2007, Microsoft Access® 2003 and 2007, and OpenOffice version 3.

  An extra directory (*'Fichiers csv'*) contains the same data sources in the .csv format
  The layout coordinates of boreholes defined in these data sources are compatible with the georeference of the Autocad® drawing. Lithological, pressuremetric, … information is fictitious.

C.5.5 Access to Terrasol website

Menu: StratiCad/Website
The website will allow you to learn more about our products or to contact us.

C.5.6 About…

Menu: StratiCad/About...
This window provides information on the StratiCad software, as well as on your license (modules available on your key).

D 'LAYOUT' MODULE

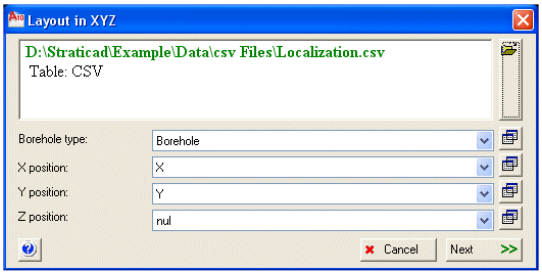
D.1 XYZ Layout of blocks associated with borehole types

 - *Menu: StratiCad/Layout in XYZ*

XYZ layout (top view) of blocks associated with borehole types

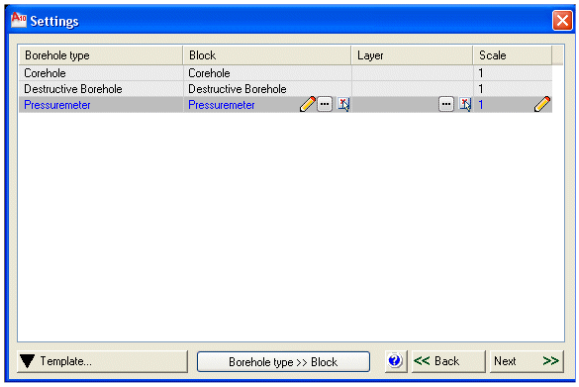
Three steps are required: data source configuration, borehole type-block association, and attribute-column association.

1) Select the data source. Then specify the column containing the borehole types (these types will later be associated with blocks of your drawing) as well as the columns where the XYZ layout position is saved. If your data source does not include levels, select "nul" for "Z position" (levels will be 0.0).



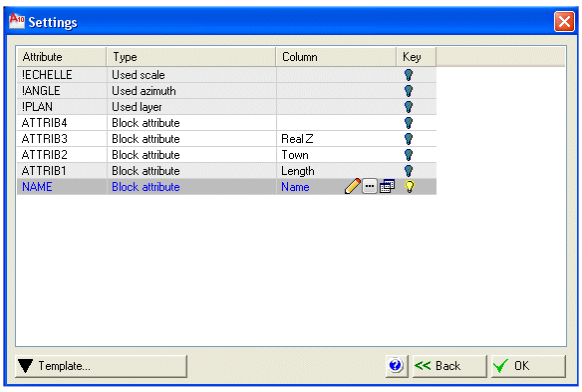
Click the **Next** button.

2) A second window displays the list of borehole types existing in the data source. Associate an existing block of your drawing to each of them. If you do not wish to use all borehole types, keep the corresponding lines of the 'Block' column empty.
You may also specify a scale factor for the blocks or choose the insertion layer. If the layer information is not provided, Straticad will use the current layer.
This window content may be saved in a file with the '*asso*' extension, and the re-used later when updating the drawing.
Moreover, if you use blocks with exactly the same names as those of the borehole types in the data source, click once the **Borehole type >> Block** button: it will automatically assign the blocks with the relevant borehole types.

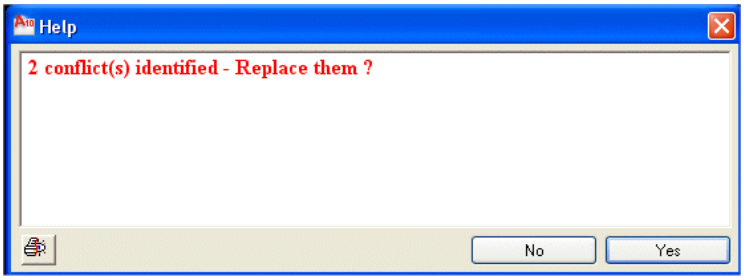


Click the **Next** button.

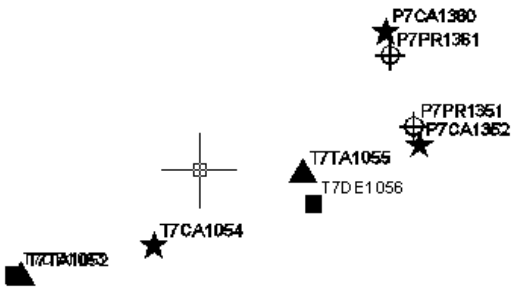
3) This new window displays the block attributes (for the blocks used in the previous step), but also specific block properties such as scale, layer, ... The names of the block properties (in the 'Attribute' column) are prefixed with the '!' character.



Each block attribute or property may be assigned with the value contained in a column of the data source. At least one attribute or property (usually the borehole name) should be defined in order to identify the boreholes already existing in the drawing, and decide whether to refresh them or not during later drawing updates.
This configuration can be saved in a file with the '*asso*' extension.



After validation, Straticad analyses your drawing. If you are working in a user-defined coordinates system (UCS), you will be asked whether to use the data source coordinates as coordinates of the current UCS or of the global coordinates system (GCS).
Moreover, if a key is defined, and if existing blocks in the drawing correspond to data source boreholes, you may replace or update them. This latter option, available with AutoCAD LT® only, allows keeping the attributes layout.



Example of a XYZ layout

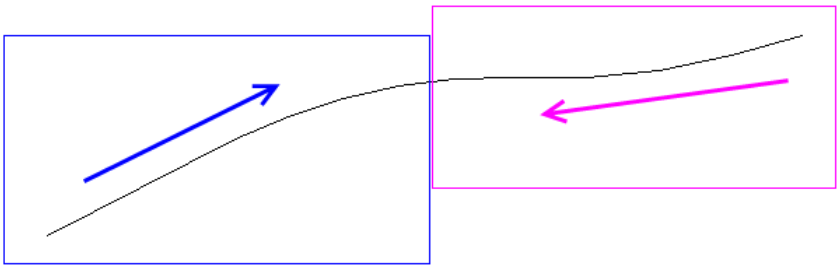
D.2 Calculating and exporting curvilinear position and properties to a data source

- Menu: StratiCad/Block export in XYZ

Calculating and exporting curvilinear position and other block properties along a given axis to a data source

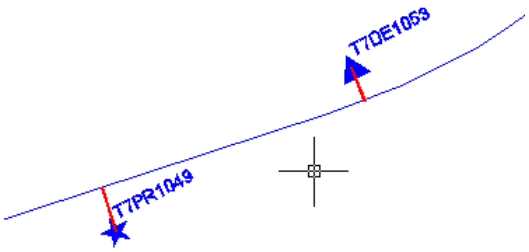
Five steps are required: selection of the projection axis (top view), selection of the blocks to be projected, data source configuration, borehole type-block association, and attribute-column association.

1) Select the top view axis: it may be a polyline with several points or a single line.
Beware: the axis direction will be determined by the position of the selection click.



The axis origin will be the closest to the clicked point.
The axis will then be directed from this origin to the second end of the axis.

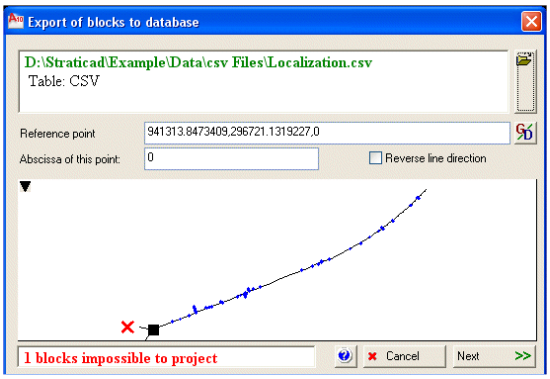
2) Select the blocks to be projected. The blocks will be projected perpendicularly to the axis. Blocks which cannot be projected will be rejected and listed in the information log.



In red: block projection method

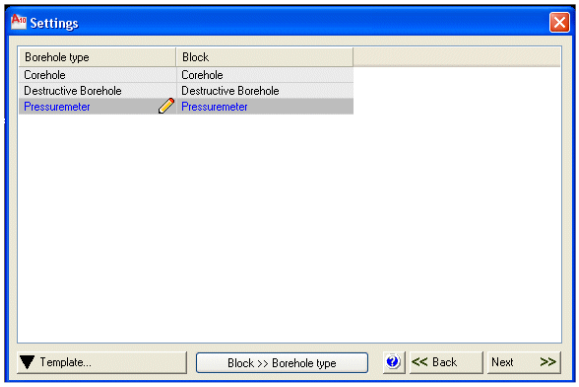
3) Choose the data source to which the block data should be exported, then complete the axis definition if required: its direction may be reversed, the curvilinear abscissa of the reference point may be indicated (marked with a black square on the preview), and the coordinates of the reference point may be changed.

If your axes always start their curvilinear abscissa at 0.0 and you select them properly, this information will not require further adjustment. Otherwise, click the G/D button to specify the origin 0,0 of your projection axis (select a point along the polyline).



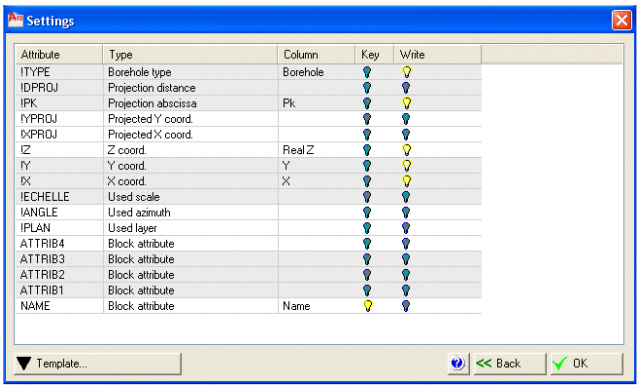
The rejected blocks are displayed in red on the preview.
Click the **Next** button.

4) The next window lists the names of the blocks to be exported. Associate a borehole type to each of them; blocks with no borehole type will not be exported.

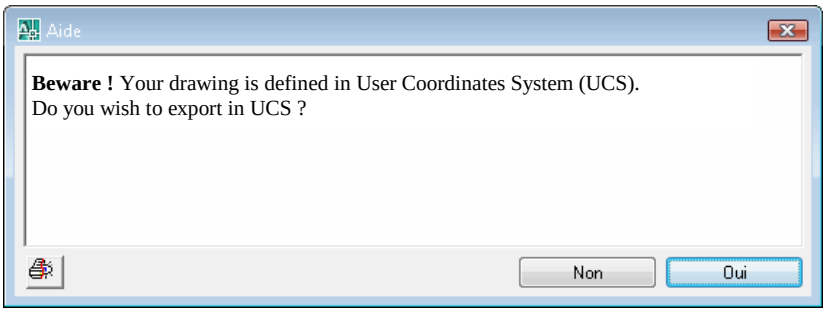


This window content may be saved in a file with the '*asso*' extension for later use.
Moreover, if you use blocks with the same names as the data source borehole types, a single click on the **Block >> Borehole type** button automatically associates the block names with the borehole types.

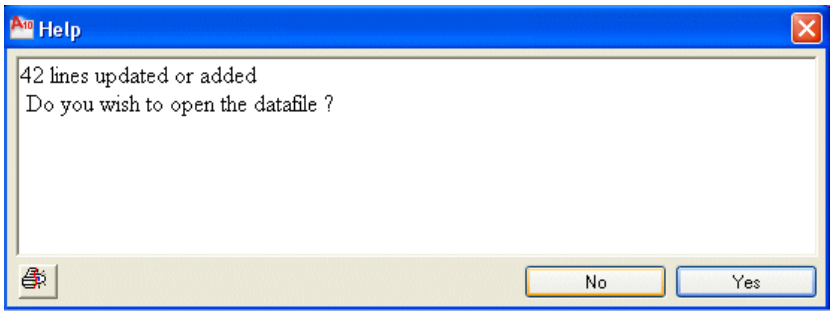
5) This last window displays the attributes of the selected blocks, specific block properties, such as scale or layer, and properties related to the projection, such as the projection distance or curvilinear position. The names of the properties that are not attributes are prefixed by the '!' character in the *'Attribute'* column.
Each attribute or property may be associated with a column in the data source. The '*Write*' column indicates the fields which will be filled. The '*Key*' column allows defining the key fields (usually the borehole name) that will identify a projected borehole in the data source. Key fields are always exported, even if their '*Write*' column is set to inactive.



Validate the window. If the drawing is defined in a user coordinates system (UCS), you may get the blocks coordinates and the projection points either in the drawing coordinates system (UCS), or in the general coordinates system (GCS). Of course, this will have an impact only if you export the XYZ or XY coordinates of the projection points.



Finally, a summary shows up and provides the number of lines updated or added in the data source. It is possible to open this data source (within the default application of the Windows® settings), or to close the window.



If blocks have been rejected, the information log is displayed and provides the description of these blocks.

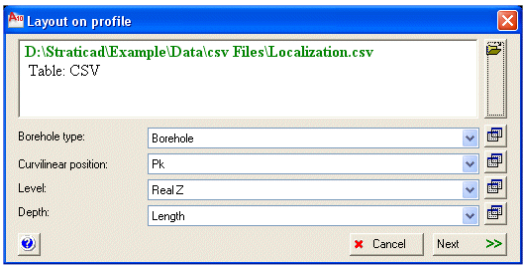
D.3 Layout of blocks associated with borehole types on a longitudinal profile

 - *Menu: StratiCad/Layout on longitudinal profile*

Layout of blocks associated with borehole types on a longitudinal profile

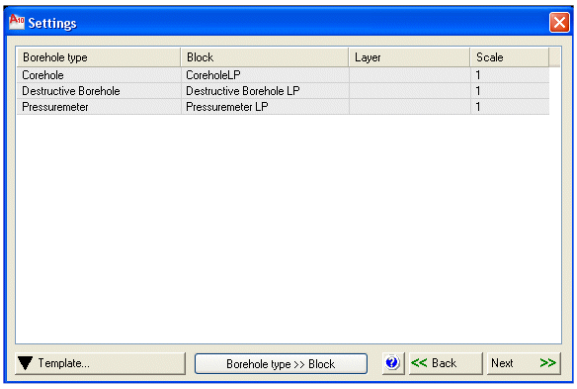
Four steps are required: data source configuration, borehole type-block association, attribute-column association, and longitudinal profile marking.

1) Select the data source. Then specify the column containing the borehole types (these types will later be associated with blocks of your drawing) as well as the columns setting the curvilinear position, level and depth of the borehole. If your data source does not include levels (or depths), select 'nul'; in this case, levels will be those of the comparison plane that you will select (and depths will be 0.0).



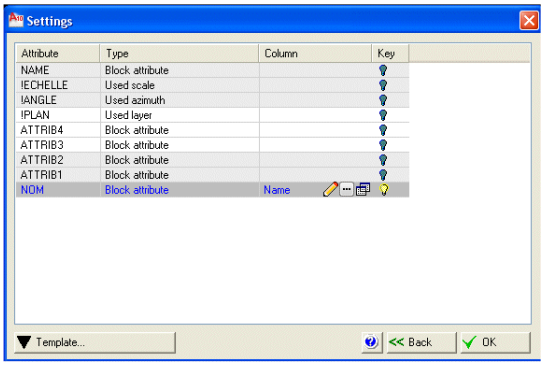
Click the **Next** button.

2) A second window displays the list of borehole types existing in the data source. Associate an existing block of your drawing to each of them. If you do not wish to use all borehole types, keep the corresponding lines of the 'Block' column empty.
You may also specify a scale factor for the blocks or choose the insertion layer. If the layer information is not provided, Straticad will use the current layer.
This window content may be saved in a file with the '*asso*' extension, and the re-used later when updating the drawing.
Moreover, if you use blocks with exactly the same names as those of the borehole types in the data source, click once the **Borehole type >> Block** button: it will automatically assign the blocks with the relevant borehole types.

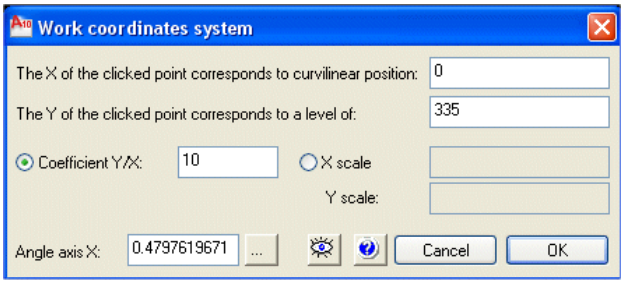


Click the **Next** button.

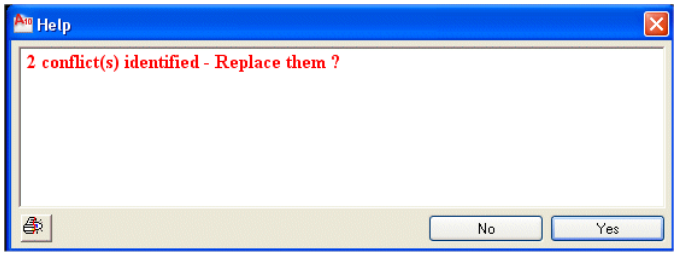
3) This new window displays the block attributes (for the blocks used in the previous step), but also specific block properties such as scale, layer, ... The names of the block properties (in the 'Attribute' column) are prefixed with the '!' character.
Each block attribute or property may be assigned with the value contained in a column of the data source. At least one attribute or property (usually the borehole name) should be defined in order to identify the boreholes already existing in the drawing, and decide whether to refresh them or not during later drawing updates.
This configuration can be saved in a file with the '*asso*' extension.

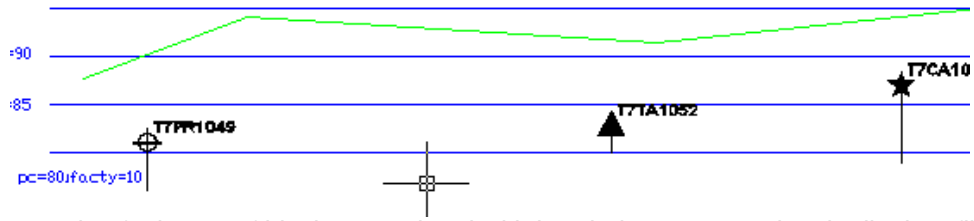


4) After validation, you should define the profile's position. Click your longitudinal profile in a point for which you know both the curvilinear position and level. In the window which is then displayed, specify this information as well as the scale factor. A preview is available (use the  button): it enables for instance to check the information displayed in the longitudinal profile title block.



Click the **OK** button: the application then analyses your drawing.
If a key is defined, and if existing blocks in the drawing correspond to data source boreholes, you may replace or update them. This latter option, available with AutoCAD LT® only, allows keeping the attributes layout.





Example of a layout of blocks associated with borehole types on a longitudinal profile

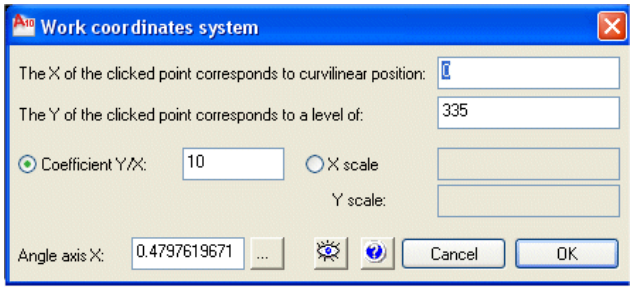
D.4 Altitude calculation on longitudinal profile

- Menu: StratiCad/Altitude calculation on profile

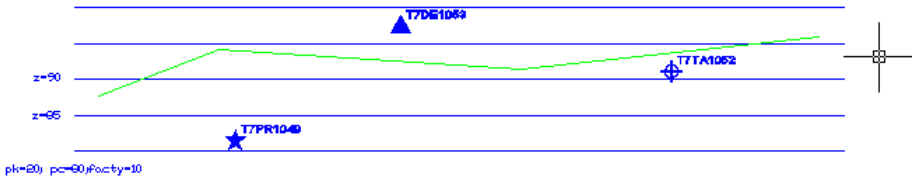
Altitude calculation on profile

Six steps are required: layout of the longitudinal profile, selection of the altitude line, selection of the blocks to process, configuration of the data source, association borehole type-block and association attribute-column.

1) Click your longitudinal profile in a point for which you know both the curvilinear position and level. In the window which is then displayed, specify this information as well as the scale factor. A preview is available (use the button): it enables for instance to check the information displayed in the longitudinal profile title block.

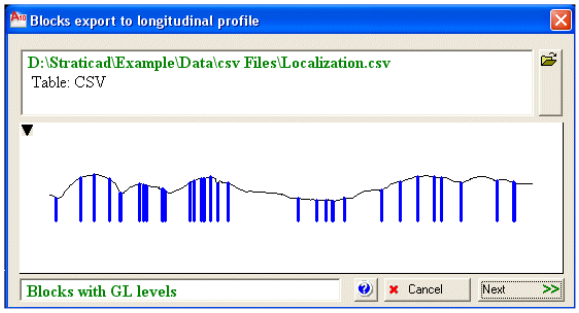


2) Click the line or polyline used to calculate the boreholes altitudes (levels). It may be a polyline representing the groundlevel, or a project line, etc.



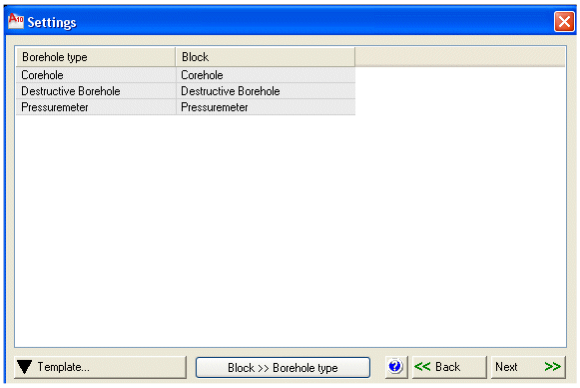
3) Select the blocks to process. They will be projected vertically on the altitude line.

4) Select the data source into which the data will be exported. If blocks cannot be processed using the selected altitude line, they appear in red in the preview, and will not be exported.



Click the **Next** button.

5) The next window displays the names of the blocks to process. Assign a borehole type to each of them; blocks for which no information is provided will not be exported.

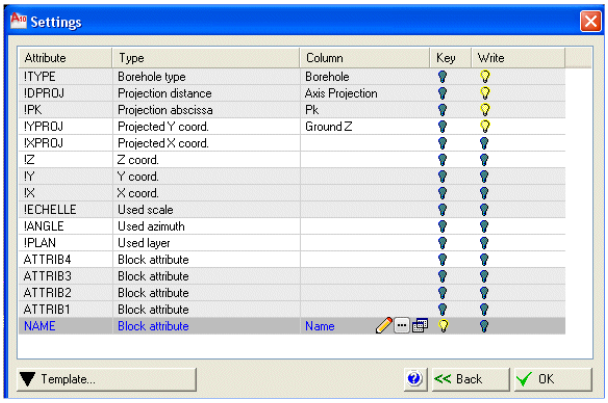


This window content may be saved in a file with the '*asso*' extension, and the re-used later when updating the drawing.
Moreover, if you use blocks with exactly the same names as those of the borehole types in the data source, click once the **Block >> Borehole type** button: it will automatically associate the blocks with the relevant borehole types.

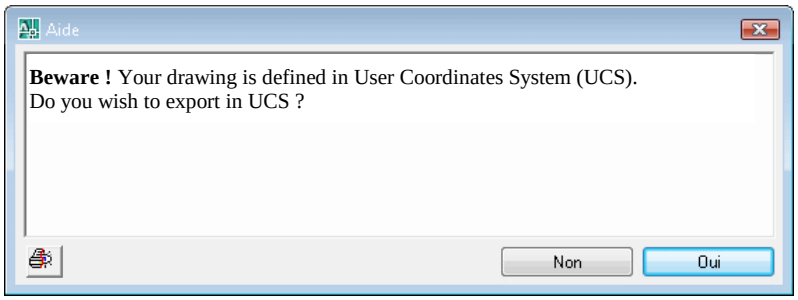
Click the **Next** button.

6) This last window displays the block attributes (for the blocks used in the previous step), but also specific block properties such as scale, layer, ... The names of the block properties (in the 'Attribute' column) are prefixed with the '!' character.

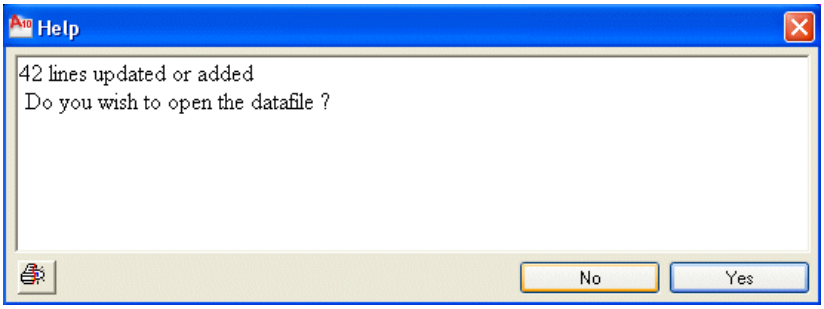
Each block attribute or property may be assigned with the value contained in a column of the data source. The '*Write*' column indicates the fields which will be exported. The '*Key*' column allows defining the key fields (usually the borehole name) that will identify a projected borehole in the data source. Key fields are always exported, even if their '*Write*' column is set to inactive.



Validate the window. If the drawing is defined in a user coordinates system (UCS), you may get the blocks coordinates and the projection points either in the drawing coordinates system (UCS), or in the general coordinates system (GCS). Of course, this will have an impact only if you export the XYZ or XY coordinates of the projection points.



Finally, a summary shows up and provides the number of lines updated or added in the data source. It it possible to open this data source (within the default application of the Windows® settings), or to close the window.

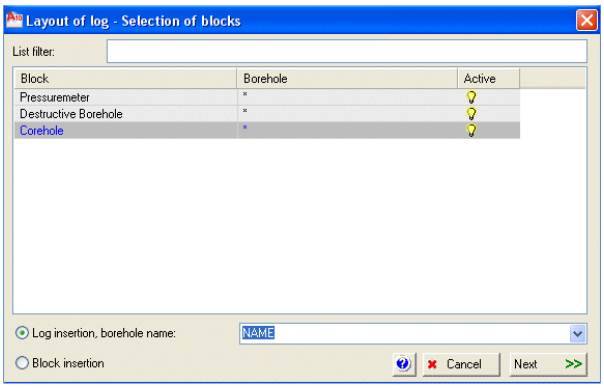


If blocks have been rejected, the information log is displayed and provides the description of these blocks.

D.5 Automatic layout of the block or log (column) on a longitudinal profile

 - *Menu: StratiCad/Layout of log*

This command is useful in the case where you have a drawing with borehole symbols defined as blocks with attributes, and you wish to associate column blocks or any other block to these boreholes. This command automates this task. The insertion points of the new blocks to be inserted are the same as those of the borehole symbols previously selected in Autocad®.
Select in your drawing the blocks representing the boreholes onto which you wish to insert any block or log (column block). A window shows up and displays the borehole corresponding to each selected block. If several blocks have the same name (for example, if several blocks are named "core drilling‘), the borehole column will display ‘*’.
Indicate the blocks you wish to process by activating the ‘*Active*’ column.

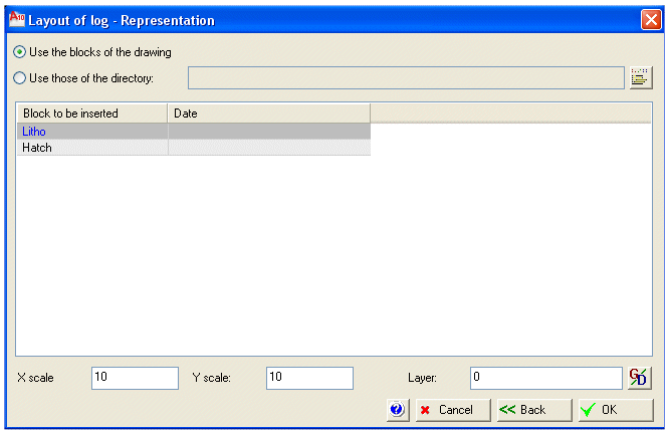


There are two insertion modes:

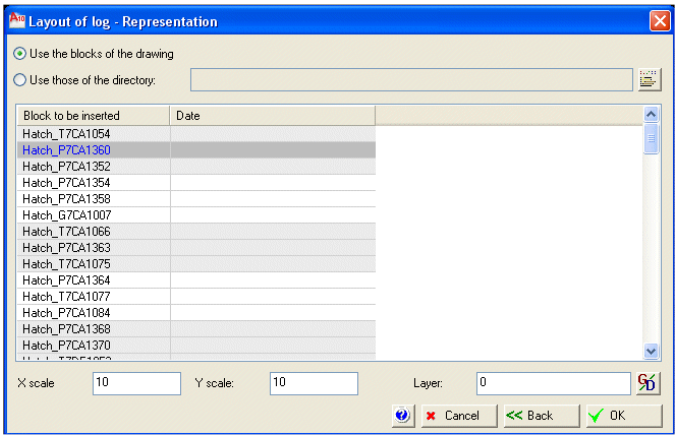
- Inserting a type of column block (curve column, level column, ...). In this case, you should specify which attribute of the selected blocks corresponds to the borehole name.
- Inserting a same block.

Click the **Next** button.

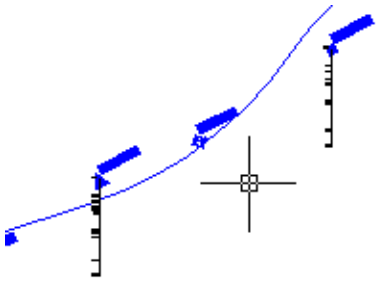
1. **Inserting a type of column block**.
   Specify whether the column blocks are located in the current drawing or in a directory as a DWG or DXF file. Then select the type of column block to be inserted by choosing its prefix. StratiCad filters the blocks in your library, and compares the name of the borehole located after the text "prefix & special character" with the text of the attribute defined in the previous step.



2. **Inserting a same block**.
   Indicate whether the block to be inserted is located in the current drawing or in a directory of your explorer as a DWG or DXF file. Then select the block. In this case, the list shows the complete block names: the "prefix" + the separator and finally the borehole name.



Before validating, check that the scale factor is appropriate and, if required, give the insertion layer (if the layer is not specified, the current layer is used).



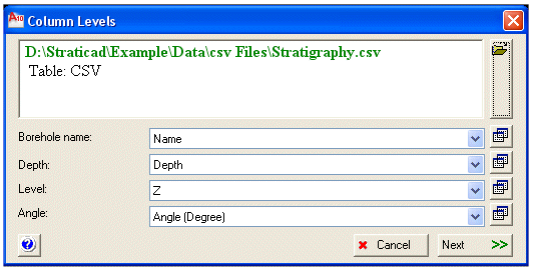
Example of insertion of column "Levels"

E Log module (borehole "columns")

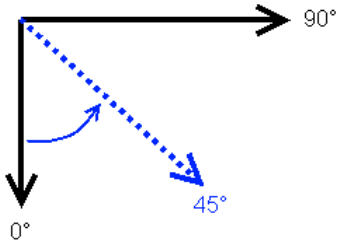
E.1 Column "Levels": levels of borehole passes (records)

Menu: StratiCad/Column Levels

Select the data source including the information, and specify the columns which contain the borehole name, the depth of the borehole passes, its level, and its tilt angle.



If you use tilt angle data, check that the angles are provided in degrees, with the 0° downwards and the 90° along the horizontal line, as shown below.



Defining the borehole tilt angle

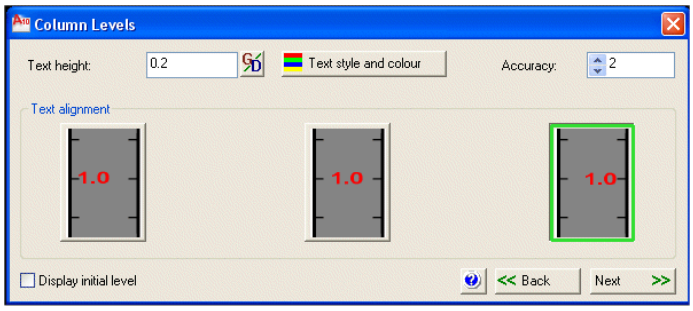
The tilt angle may be ignored (select '*nul*') or given in grades (if the angle is provided with the letter '*g*' right after the angle value). For example, twenty grades would be '*20g*'.

	A	B	C	D	E	F
1	Name	Z	Depth	Stratigraphy	Code	Angle (Degree)
11	G7CA1007	370.256	5.3	Clayey silts.	B1	15
12			10.7	Marl	A3	

Altitude and tilt angle do not need to be repeated for each record or pass: if one of these data is not specified, it is assigned the same value as the previous record.
For instance, in the spreadsheet above, where column B is altitude and F the tilt angle, the record on line 5 will be assigned the same values as line 4, i.e. level Z = 370.256m and tilt angle = 15°.

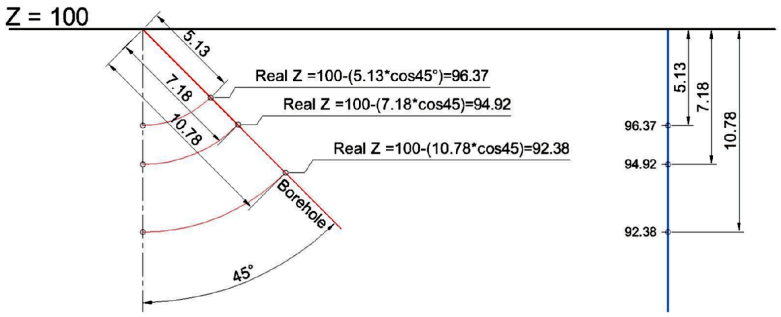
Click the **Next** button.

The settings window appears: specify text alignment, style, colour, optionally its layer, and its accuracy. The checkbox **Display initial level** allows copying the initial level at the top of the column.



Click the **Next** button and go to section **Columns validation**.

The column represents the borehole vertically. The depth of a record hence corresponds to the 'Delta Y' information supplied by the AutoCAD® 'distance' command applied between the origin of the column and the record position. The text will display the corresponding level.



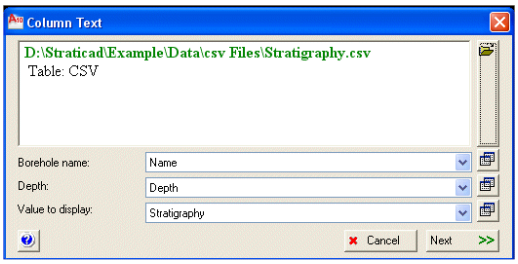
On the left: representation of the "real" borehole (in red)
On the right: the column displayed by Straticad (in blue)

E.2 Column "Text"

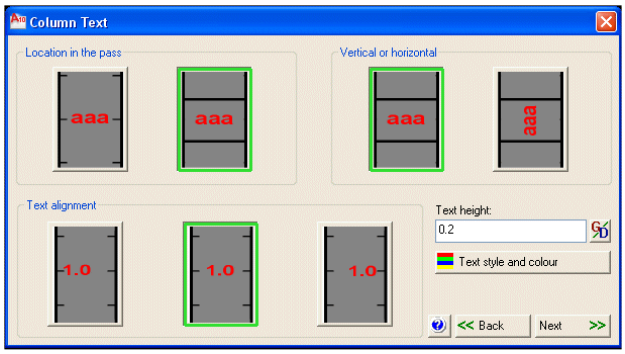
Menu: StratiCad/Column Text

Text column, displays information at the end or in the middle of passes

Select the data source including the information, and specify the columns which contain the borehole name, the depth of the borehole passes, and the text to be displayed.

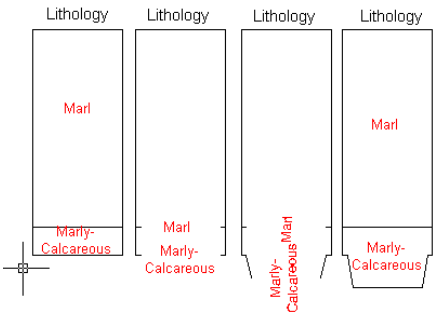


Adjust the text settings: its location (middle or end of pass), its direction (horizontal or vertical), its alignment (centred, left, or right), its height, its style, its colour, and its layer.



Here are a few examples, with from left to right:

- Horizontal text in the middle of passes,
- Horizontal text at the end of passes,
- Vertical text at the end of passes,
- Vertical text in the middle of passes.



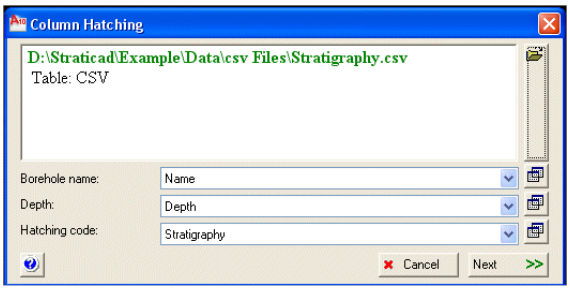
Click the **Next** button and go to section **Columns validation**.

E.3 Column "Hatching"

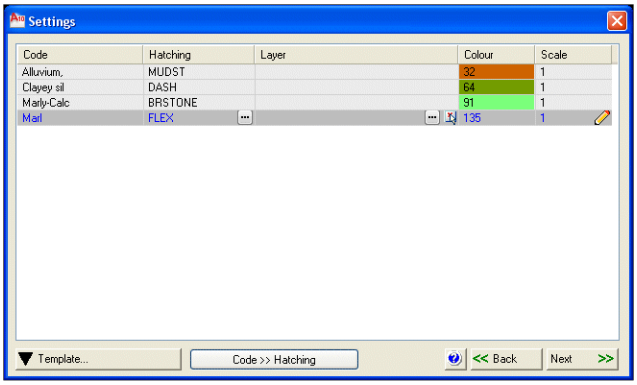
Menu: StratiCad/Column Hatching

Hatching column, each pass is associated with a hatching code

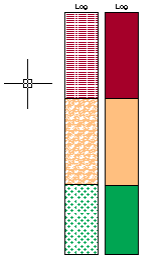
Select the data source including the information, and specify the columns which contain the borehole name, the depth of the borehole passes, and the hatching code to use.



The hatching code is considered only with the first ten characters of the string contained in the data source. For each hatching code, specify the hatching pattern to be used, its layer (if no layer information is provided, the current layer is used), its colour, and its scale factor. If the hatching code is not provided, the corresponding zones will not be hatched.



The content of this window may be saved in a file with the '*hach*' extension for later use. Moreover, if you use codes with the same names as the hatching patterns, clicking the **Code >> Hatching** button will automatically associate the hatching patterns with the codes.



Example of the same column processed either with hatching patterns or with solid hatching.

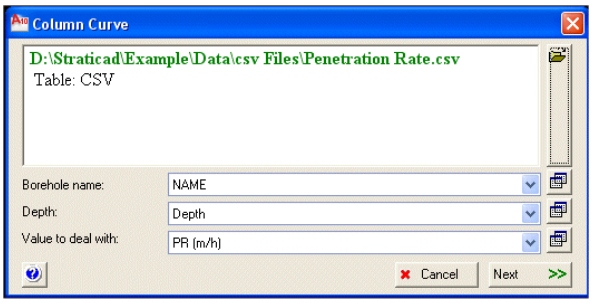
Click the **Next** button and go to section **Columns validation**.

E.4 Column "Curve"

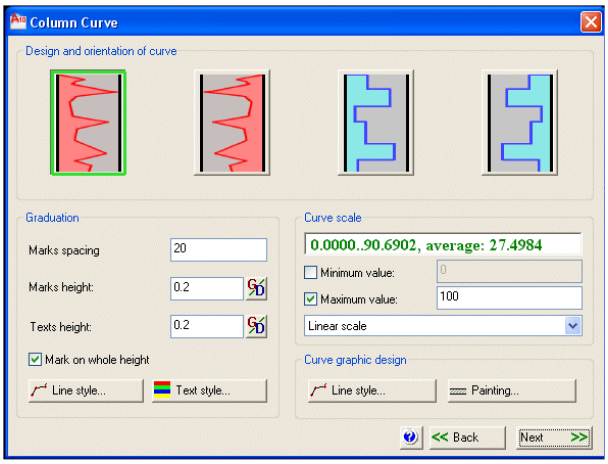
Menu: StratiCad/Column Curve

Curve column, a curve is represented for a given variable as a function of passes depth

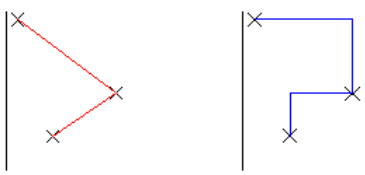
Select the data source including the information, and specify the columns which contain the borehole name, the depth of the borehole passes, and the variable for which to draw the curve.
If a borehole has a pass with either depth or variable value missing, the curve will stop at this point and resume at the next pass with full information.



Click the **Next** button to switch to the graphic settings of the column.



There are two types of renderings: either curve type, or histogram type. In both cases, the graph may be drawn on the left or right side. The line and painting styles should be defined in the "*Curve graphic design"* frame.
The curve type directly connects points to each other.
The histogram shape uses intermediate points in order to define "steps", as shown on the figure below.

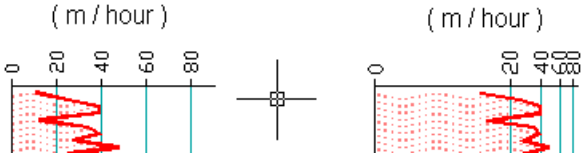


Curve type (left, in red) and histogram type (right, in blue)

The "*Graduation*" frame allows defining scale divisions.
The '*Marks spacing*' field specifies the scale division value. If this zone is empty or equal to 0.0, the graduations will not be displayed.
Each graduation has a text (use the '*Text style*' button for settings), a mark line (customisable height), and optionally another line along the whole column height (use the '*Line style*' button for settings).

From left to right: graduation with mark over the entire curve height; simple graduation; no graduation.

The "*Curve scale*" frame displays (in green) the minimum, maximum and average record values for all boreholes. The first two values are used to define the range of values represented on the curve (thus ensuring that by default, all values are displayed). But you may customise (force) the minimum and maximum values by checking the appropriate checkboxes.
The scale may be linear or logarithmic.
Beware: any value below 1.0 in logarithmic scale will be represented at 1.0.



Linear scale (on the left) and logarithmic (on the right)

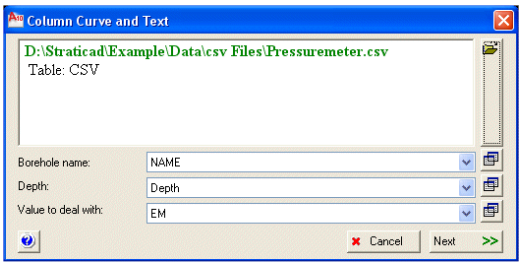
Click the **Next** button and go to section **Columns validation**.

E.5 Column "Curve and text"

Menu: StratiCad/Column Curve and Text

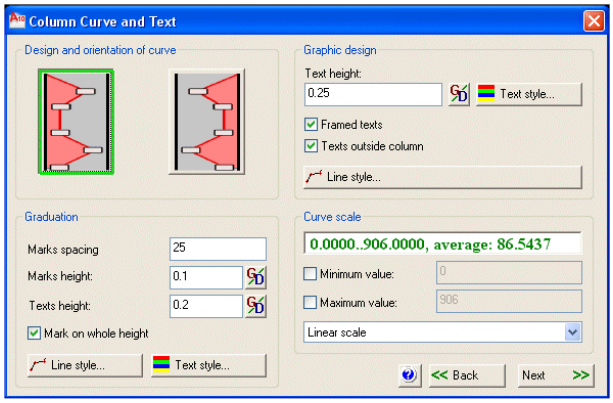
Curve and text column, combination of both tools "Column Curve" and "Column Text"

Select the data source including the information, and specify the columns which contain the borehole name, the depth of the borehole passes, and the variable for which to draw the curve.
If a borehole has a pass with either depth or variable value missing, the curve will stop at this point and resume at the next pass with full information.

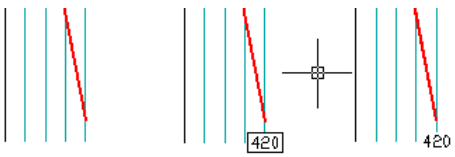


Click the **Next** button.

The next window allows defining the graphical aspect of the column. The curve may be displayed either on the left or right side. A graduation system may be activated in the '*Graduation*' frame by merely specifying a non zero marks spacing (scale division). Also, a scale system allows framing the column. Please refer to the command "Column curve" for more details (chapter E.4).



The texts may be framed and displayed even if the corresponding value is "out-of-scale".



Example of an " out-of-scale "value, from left to right: text non provided, framed text, simple text.

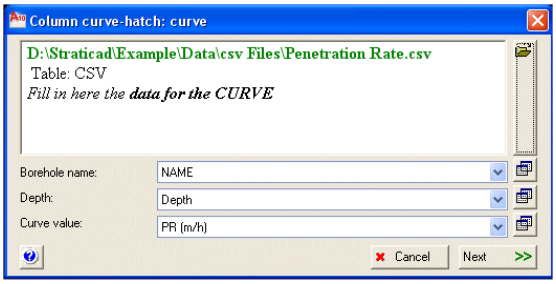
Click the **Next** button and go to section **Columns validation**.

E.6 Column "Curve and hatching"

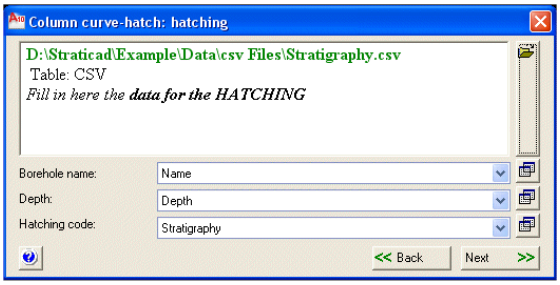
Menu: StratiCad/Column Curve and Hatching

Column Curve and hatching, combination of both tools "Column Curve" and "Column Hatching"

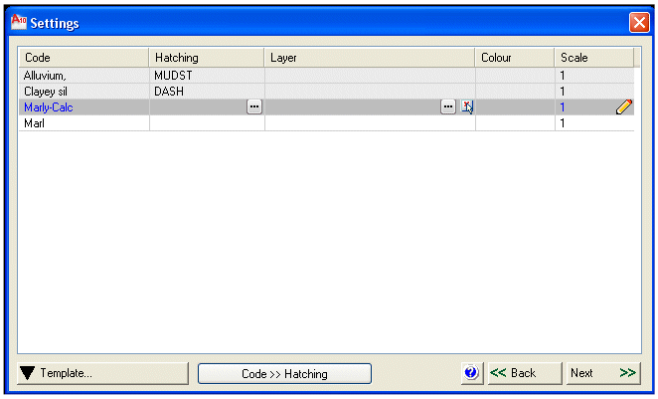
This command uses two data sources which may be different: the one providing the curve data and the one containing the hatching information.
First, select the data source with the curve data (borehole name, depth, variable value to process).



Click the **Next** button and select the data source containing the hatching information (borehole name, depth, hatching code). By default, it is the same data source as the one defined for the curve data. Only the data relating to boreholes also existing in the "curve" data source will be used. Please make sure that the boreholes length in both data sources is consistent.

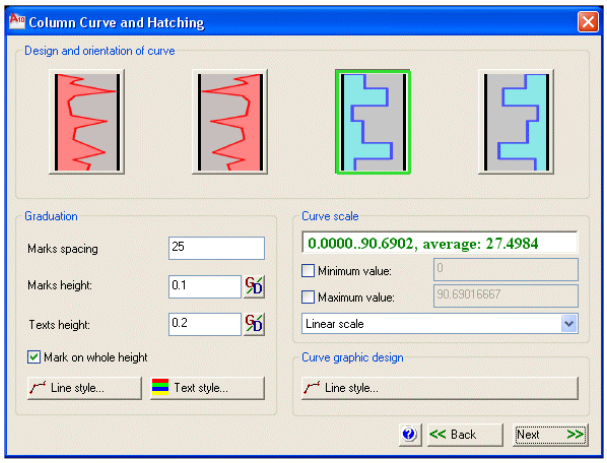


Click the **Next** button in order to associate hatching patterns to the hatching codes.
The hatching settings are similar to those of the hatching column command (chapter E.3). The hatching code is considered only with the first ten characters of the string in the data source. For each hatching code, specify the hatching pattern to use, its layer (if no layer information is provided, the current layer is used), its colour and its scale factor. If the hatching pattern information is not provided, the corresponding zones will not be hatched.

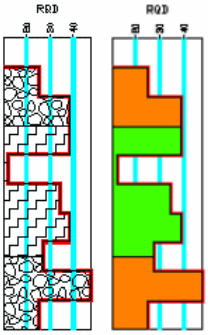


The content of this window may be saved in a file with the '*hach*' extension for later use. Moreover, if you use codes with the same names as the hatching patterns, clicking the **Code >> Hatching** button will automatically associate the hatching patterns with the codes.

Click the **Next** button, the graphical settings window shows up.



As for the curve column tool (chapter E.4), there are 4 possible curve types: 4 combinations of curve/histogram shapes and left/right sides. A graduation system may be activated in the '*Graduation*' frame by merely specifying a non zero marks spacing (scale division). Also, a scale system allows framing the column. Please refer to the command "Column curve" for more details (chapter E.4).



Example of 'Curve and hatching' column: hatching pattern (left) and solid hatching (right).

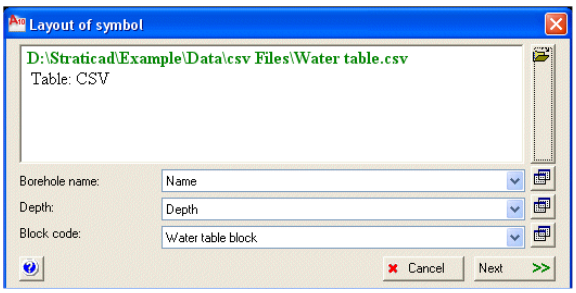
Click the **Next** button and go to section **Columns validation**.

E.7 Column "Symbols"

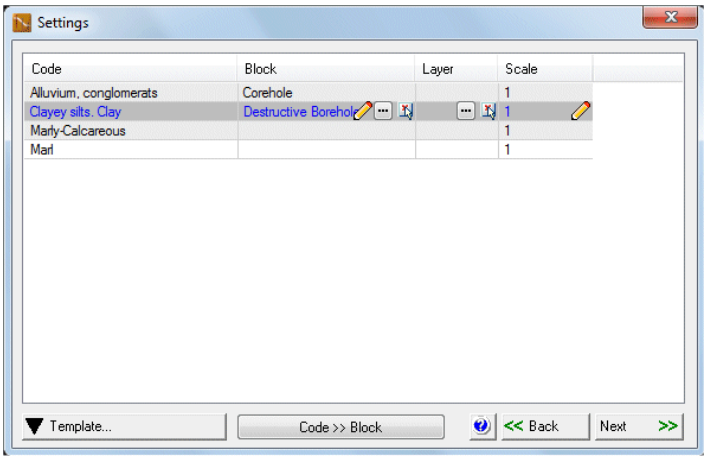
Menu: StratiCad/Column Symbols

Symbol column, inserts blocks (which may have attributes) at given depths

Select the data source including the information, and specify the columns which contain the borehole name, the depth of the borehole passes, and a code corresponding to the blocks to be inserted.
This block code will be later associated to a drawing block.

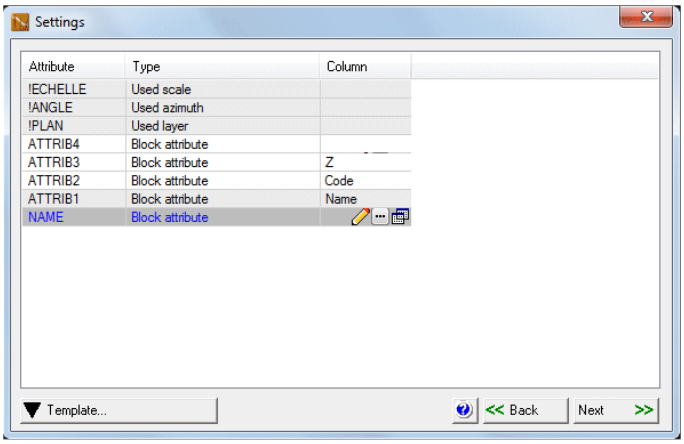


Click the **Next** button.
A new window displays the list of block codes retrieved from the data source. Assign to each of them, the relevant drawing block. In order to ignore part of the blocks, keep their '*Block*' column empty. You may also define a scale factor for the blocks, or an insertion layer. If no layer information is provided, the current layer is used.



The content of this window may be saved in a file with the '*asso*' extension for later use.
Moreover, if you use codes with the same names as the blocks, clicking the **Code >> Block** button will automatically associate the blocks with the codes.
Click the **Next** button.

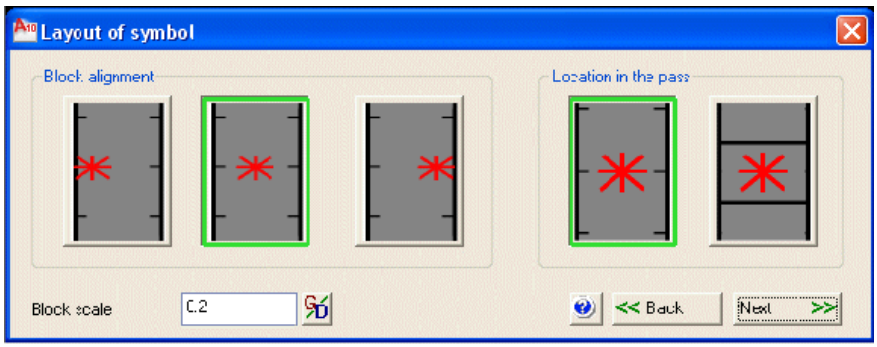
The attributes of the blocks used in the previous step are displayed also with properties specific to the blocks such as the scale, layer, ... The properties of the blocks have their name prefixed by the '!' character in the *'Attribute'* column.

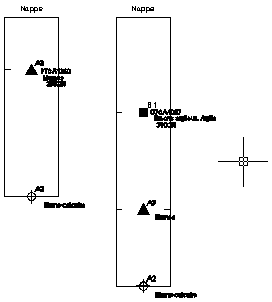


Each attribute or block property may be assigned with the value of a data source column. If a scale is defined here, it overwrites the scale value of the previous step.
This setting may be saved in a file with the '*asso*' extension.

Click the **Next** button.

The column's layout should now be defined: left/center/right alignment, position at the end or in the middle of the passes. A global block scale factor may be provided: it will be multiplied with each block scale in order to get the scale factor in the drawing.





Example of a symbols column

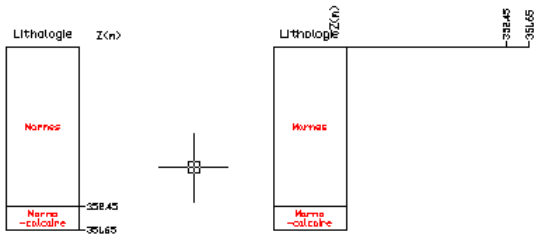
Click the **Next** button and go to section **Columns validation**.

E.8 Metablock column

Menu: StratiCad/Metablock column

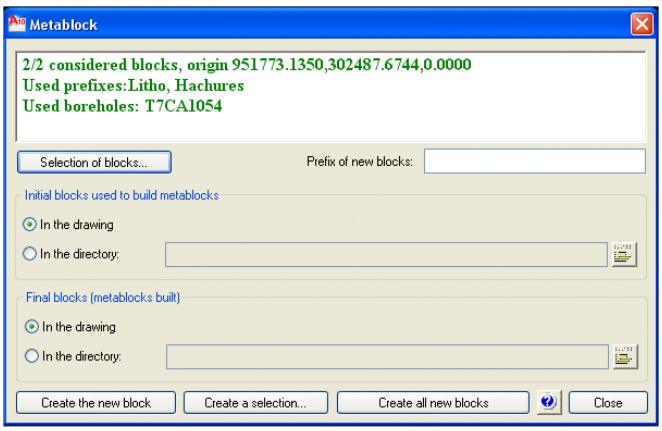
Metablock column, group of different column types

First define the required column blocks in your drawing: for example column "Curve" or column "Levels".
Beware: these column blocks should have a prefix.



Example of two possible configurations, with column "Text" and column "Levels"

Use the ***Selection of blocks*** button to select the columns of your model and define the model insertion origin. The selection order will be used as a priority creation order to handle plotting order issues. Once done, the large information zone displays a summary.



The new column blocks generated from the selected model may have a prefix. The initial columns used to create the metablock should exist in the blocks library of the current drawing, or in a directory in the form of DWG or DXF files. Also, the metablock will be created in the current drawing or in a directory in the form of DWG or DXF files.

There are three methods to create blocks: creation of the borehole(s) used in the model; creation of a selection of boreholes; creation of all boreholes. In the last two cases, only the blocks with a prefix will be processed.

